

Ciągi Sequences Starters

Starter 1 (1 of 3)

Q1. Matchstick Pattern



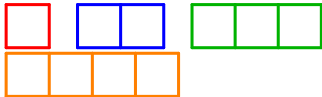
- (a) Draw the 4th shape.
(b) How many matchsticks does it use?

Q2. Complete the ^{ciąg}Sequence

5, 10, 15, 20, __, __, __

Starter 1 (1 of 3)

Q1. Matchstick Pattern



- (a) Draw the 4th shape.
(b) How many matchsticks does it use?
(b) 13 matchsticks

Q2. Complete the ^{ciąg}Sequence

5, 10, 15, 20, 25, 30, 35

(add 5 each time)

Starter 1 (2 of 3)

Q3. Write the first 5 **terms** of the **sequence** with
wzór na n-ty wyraz ciągu
position-to-term rule : $2n$

— ' — ' — ' — ' —

Q4. Sam writes the 3 **times table** : 3, 6, 9, 12, 15 ...
He then **adds 2** to every **term** . Write the first 5 **terms** of Sam's
sequence. What is the **n th term** rule?

Starter 1 (2 of 3)

Q3. Write the first 5 **terms** of the **sequence** with
wzór na n-ty wyraz ciągu
position-to-term rule : $2n$

2, 4, 6, 8, 10

Q4. Sam writes the 3 **times table** : 3, 6, 9, 12, 15...

He then **adds 2** to every **term** . Write the first 5 **terms** of Sam's
ciąg wzór na n-ty wyraz
sequence. What is the ***n*th term** rule?

Wyrazy wzór na n-ty wyraz

Terms : 5, 8, 11, 14, 17. ***n*th term** : $3n + 2$

Starter 1 (3 of 3)

Q5. Extending Q1

Using the matchstick pattern from Q1:

(a) How many matchsticks in the **10th** shape?

(b) Write a rule for the n th shape.

Q6. Challenge

Is 100 a **wyrazem** **ciągu**
term in the **sequence**
wzór na n-ty wyraz
with **n th term** $3n + 1$?

Show how you know.

Starter 1 (3 of 3)

Q5. Extending Q1

Using the matchstick pattern from Q1:

(a) How many matchsticks in the **10th** shape?

(b) Write a rule for the n th shape.

(a) 31 matchsticks.

wzór na n -ty wyraz ciągu

(b) position-to-term rule : $3n +$

1

Q6. Challenge

Is 100 a **wyrazem** **ciągu** **term** in the **sequence** **wzór na n -ty wyraz**

with **n th term** $3n + 1$?

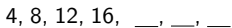
Show how you know.

Yes, when $n = 33$,

$$3n + 1 = 3 \times 33 + 1 = 99 + 1 = 100$$

ciąg

Q2. Complete the Sequence



- (a) Draw the 4th picture.
(b) How many dots does it contain?

Starter 2 (1 of 3)

Q1. Dot Pattern



- (a) Draw the 4th picture.
(b) How many dots does it contain?

(b) 16 dots

Q2. Complete the ^{ciąg}Sequence

4, 8, 12, 16, 20, 24, 28

(add 4 each time)

Starter 2 (2 of 3)

Q3. Write the first 5 **terms** of $3n + 1$

—, —, —, —, —

Q4. Alex writes the 5 **times table** : 5, 10, 15, 20, 25... He then **subtracts 1** from every **term**. Write the first 5 **terms** of Alex's **sequence**. What is the **n th term** rule?

Starter 2 (2 of 3)

wyrazów

Q3. Write the first 5 **terms** of $3n + 1$

4, 7, 10, 13, 16

tabliczka mnożenia

Q4. Alex writes the 5 **times table** : 5, 10, 15, 20, 25... He then

wyrazu

wyrazów

subtracts 1 from every **term** . Write the first 5 **terms** of Alex's

ciąg

wzór na n-ty wyraz

sequence. What is the ***n*th term** rule?

Wyrazy

wzór na n-ty wyraz

Terms : 4, 9, 14, 19, 24.

***n*th term**

: **$5n - 1$**

Starter 2 (3 of 3)

Q5. Extend Q1

Using your dot pattern from Q1:

(a) How many dots in the **10th** picture?

(b) Write a rule for the n th picture.

Q6. Challenge

Ciąg wzór na n -ty wyraz
Sequence A has n th term

$$4n - 2.$$

Ciąg wzór na n -ty wyraz
Sequence B has n th term

$$2n + 6.$$

wyraz
Do they share a term

at the same position?

Starter 2 (3 of 3)

Q5. Extend Q1

Using your dot pattern from Q1:

(a) How many dots in the **10th** picture?

(b) Write a rule for the n th picture.

(a) 40 dots. (b) Rule: $4n$

Q6. Challenge

Ciąg wzór na n -ty wyraz
Sequence A has n th term

$$4n - 2.$$

Ciąg wzór na n -ty wyraz
Sequence B has n th term

$$2n + 6.$$

wyraz
Do they share a term

at the same position?

$4n - 2 = 2n + 6 \Rightarrow n = 4$. Both
equal **14** at position $n = 4$.

Starter 3 (1 of 3)

Q1. Matchstick Triangles



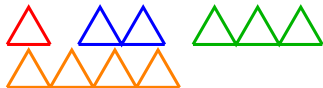
- (a) Draw the 4th shape.
(b) How many matchsticks does it use?

Q2. Complete the ^{ciąg}Sequence

7, 14, 21, 28, __, __, __

Starter 3 (1 of 3)

Q1. Matchstick Triangles



- (a) Draw the 4th shape.
(b) How many matchsticks does it use?

(b) 12 matchsticks

Q2. Complete the ^{ciąg}Sequence

7, 14, 21, 28, 35, 42, 49

(add 7 each time — the
tabliczka mnożenia
7 × table)

Starter 3 (2 of 3)

Q3. Write the first 5 **wyrazów** **terms** of $5n - 2$

—, —, —, —, —

Q4. A **ciąg** **sequence** starts at 5 and increases by 3 each time. Write the first **wyrazów** **wzór na n-ty wyraz** 5 **terms**. What is the **nth term** rule?

Starter 3 (2 of 3)

wyrazów

Q3. Write the first 5 **terms** of $5n - 2$

3, 8, 13, 18, 23

ciąg

Q4. A **sequence** starts at 5 and **increases by 3** each time. Write the first

wyrazów

wzór na n-ty wyraz

5 **terms** . What is the n **th term** rule?

Wyrazy

wzór na n-ty wyraz

Terms : 5, 8, 11, 14, 17.

n **th term**

: $3n + 2$

Starter 3 (3 of 3)

Q5. Extending Q1

Using your triangle pattern from Q1:

- (a) Write a rule for the n th shape.
- (b) How many matchsticks in the **20th** shape?

Q6. Challenge

wzór na n -ty wyraz

The n th term of a
ciągu

sequence is $4n + 3$.

wyraz

Which term is the first to exceed

75?

Show your working clearly.

Starter 3 (3 of 3)

Q5. Extending Q1

Using your triangle pattern from Q1:

- (a) Write a rule for the n th shape.
- (b) How many matchsticks in the 20th shape?

(a) Rule: $3n$. (b) 60 matchsticks.

Q6. Challenge

wzór na n -ty wyraz

The n th term of a
ciąg

sequence is $4n + 3$.

wyraz

Which term is the first to exceed

75?

Show your working clearly.

$4n + 3 > 75 \Rightarrow n > 18$. 19th
wyraz

term : $4(19) + 3 = 79$.

Starter 4 (1 of 3)

Q1. Dots



(a) Draw the 4th pattern.

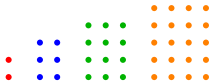
(b) How many dots does it contain?

Q2. Complete the ^{ciąg}Sequence

1, 5, 9, 13, __, __, __

Starter 4 (1 of 3)

Q1. Dots



- (a) Draw the 4th pattern.
(b) How many dots does it contain?
(b) 20 dots

Q2. Complete the ^{ciag}Sequence

1, 5, 9, 13, 17, 21, 25

(add 4 each time)

Starter 4 (2 of 3)

Q3. Write the first 5 **wyrazów** **terms** of $10 - 2n$

_ ' _ ' _ ' _ ' _

Q4. Mia writes the 6 **tabliczka mnożenia** **times table** : 6, 12, 18, 24, 30 ... She then **wyrazu** **wyrazów** **subtracts 4** from every **term** . Write the first 5 **terms** , find the **wzór na n-ty wyraz** **wyraz** **nth term** , and find the 50th **term** .

Starter 4 (2 of 3)

Q3. Write the first 5 **terms** of $10 - 2n$

8, 6, 4, 2, 0

Q4. Mia writes the 6 **times table** : 6, 12, 18, 24, 30 ... She then **subtracts 4** from every **term** . Write the first 5 **terms** , find the **n th term** , and find the 50th **term** .

Wyrazy **wzór na n -ty wyraz**
Terms : 2, 8, 14, 20, 26. **n th term** : $6n - 4$. 50th **wyraz**
term : **296**.

Starter 4 (3 of 3)

wzór na n-ty wyraz

Q5. Find the ***n*th Term**

1, 5, 9, 13, 17, ...

wzór na n-ty wyraz

What is the ***n*th term**

rule?

Q6. Challenge

wzór na n-ty wyraz

The ***n*th term** of a
ciąg

sequence is $10 - 2n$.

liczba dodatnia

Which is the **last** **positive**
wyraz

term ?

ujemny wyraz

What is the **first** **negative** **term** ?

Starter 4 (3 of 3)

wzór na n-ty wyraz

Q5. Find the n th Term

1, 5, 9, 13, 17, ...

wzór na n-ty wyraz

What is the n th term

rule?

Różnice wyraz

Differences: +4. First term : 1.

Rule: $4n - 3$

Q6. Challenge

wzór na n-ty wyraz

The n th term of a

ciągu

sequence is $10 - 2n$.

liczba dodatnia

Which is the last positive

wyraz

term ?

ujemny wyraz

What is the first negative term ?

liczba dodatnia

$n = 4$: +2 (last positive).

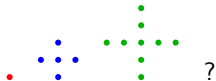
$n = 5$: 0.

ujemny

$n = 6$: -2 (first negative).

Starter 5 (1 of 3)

Q1. Dots



(a) Draw the 4th shape.

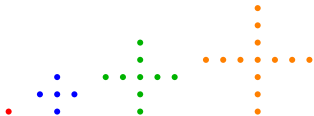
(b) How many dots in shape 5?

Q2. Complete the ^{ciąg}Sequence

1, 4, 9, 16, __, __, __

Starter 5 (1 of 3)

Q1. Dots



- (a) Draw the 4th shape.
(b) How many dots in shape 5?

(b) Shape 5 has 17 dots

Q2. Complete the ^{ciąg}Sequence

1, 4, 9, 16, 25, 36, 49

liczby kwadratowe

(square numbers , n^2)

Starter 5 (2 of 3)

wyrazów

Q3. Write the first 5 **terms** of $2n + 5$

—, —, —, —, —

wzór na n-ty wyraz

Q4. Find the ***n*th Term**

(a) 3, 5, 7, 9, 11, ...

(b) 6, 10, 14, 18, 22, ...

Starter 5 (2 of 3)

wyrazów

Q3. Write the first 5 **terms** of $2n + 5$

7, 9, 11, 13, 15

wzór na n-ty wyraz

Q4. Find the ***n*th Term**

(a) 3, 5, 7, 9, 11, ... $2n + 1$

(b) 6, 10, 14, 18, 22, ... $4n + 2$

Starter 5 (3 of 3)

Q5. Jake says:

"I start at 3 and add 4 each time."

(a) Write his first 5 **wyrazów** **terms**, (b)

wzór na n-ty wyraz
find the **nth term** rule,

and (c) decide whether **59** is in his **ciąg** **sequence**. Show your reasoning.

Q6. Challenge

Mia's **ciąg** **sequence** has
wzór na n-ty wyraz

nth term $3n + 1$.

Jake's **ciąg** **sequence** has
wzór na n-ty wyraz

nth term $2n + 6$.

Find the **first three values** that appear
ciągi
in **both sequences**. What do you notice
about them?

Starter 5 (3 of 3)

Q5. Jake says:

"I start at 3 and add 4 each time."

(a) Write his first 5 **wyrazów** **terms**, (b)

find the **wzór na n-ty wyraz** **n th term** rule,

and (c) decide whether **59** is in his **ciąg** **sequence**. Show your reasoning.

(a) 3, 7, 11, 15, 19.

(b) **wzór na n-ty wyraz** **n th term** : $4n - 1$.

(c) $4n - 1 = 59 \Rightarrow n = 15$. **Yes!**
wyraz
(15th **term**)

Q6. Challenge

Mia's **ciąg** **sequence** has
wzór na n-ty wyraz

n th term $3n + 1$.

Jake's **ciąg** **sequence** has
wzór na n-ty wyraz

n th term $2n + 6$.

Find the **first three values** that appear
ciągi
in **both sequences**. What do you notice
about them?

Shared values: 10, 16, 22, ...

(they increase by 6 each time).

Starter 6 (1 of 3)

Q1. Matchstick Triangles



(a) Draw the 4th shape.

(b) How many matchsticks does it use?

tabliczki mnożenia

(c) Which times tables does

ciąg

the sequence represent?

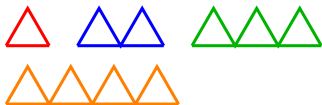
Q2. Complete the Sequence

ciąg

4, 8, 12, 16, __, __, __

Starter 6 (1 of 3)

Q1. Matchstick Triangles



(a) Draw the 4th shape.

(b) How many matchsticks does it use?

tabliczki mnożenia

(c) Which times tables does

ciąg

the sequence represent?

(b) 12 matchsticks

tabliczka mnożenia

(c) The 3 times table

ciąg

Q2. Complete the Sequence

4, 8, 12, 16, 20, 24, 28

Starter 6 (2 of 3)

tabliczka mnożenia

wzór na n-ty wyraz

Q3. The 3 **times table** has **nth term** rule $3n$, what
is the **nth term** rule for the 5 **times table** ? ____

wzór na n-ty wyraz

tabliczka mnożenia

wyrazów

Q4. Write the first 5 **terms** of $3n + 4$

__, __, __, __, __

Starter 6 (2 of 3)

Q3. The 3 ^{tabliczka mnożenia} **times table** has ^{wzór na n-ty wyraz} **nth term** rule $3n$, what ^{wzór na n-ty wyraz} is the ^{tabliczka mnożenia} **nth term** rule for the 5 **times table** ? $5n$

Q4. Write the first 5 ^{wyrazów} **terms** of $3n + 4$

$7, 10, 13, 16, 19$

Starter 6 (3 of 3)

- Q5. A **sequence** is made by taking the **3 times table** and subtracting 2 from every **term**.
- (a) Write the first 5 **terms**.
- (b) What is the **n th term** rule?
- (c) Use your rule to find the **20th term**.
- (d) Is 100 in the **sequence**? Show your working clearly.

Starter 6 (3 of 3)

Q5. A **sequence** is made by taking the **3** **times table** and subtracting **2** from every **term**.

- (a) Write the first 5 **terms**.
- (b) What is the **n th term** rule?

(c) Use your rule to find the **20th term**.

(d) Is 100 in the **sequence**? Show your working clearly.

(a) 1, 4, 7, 10, 13. (b) $3n - 2$. (c) $3 \times 20 - 2 = 58$.

(d) $3n - 2 = 100 \Rightarrow 3n = 102 \Rightarrow n = 34$. **Yes**, 100 is the 34th **term**.

Starter 7 (1 of 3)

Q1. Dots



(a) Draw the 4th picture.

(b) How many dots does it contain?

tabliczka mnożenia

(c) Which times table does

ciąg

the sequence represent?

ciąg
Q2. Complete the Sequence

5, 10, 15, 20, __, __, __

Starter 7 (1 of 3)

Q1. Dots



(a) Draw the 4th picture.

(b) How many dots does it contain?

tabliczka mnożenia

(c) Which times table does

ciąg

the sequence represent?

(b) 16 dots

tabliczka mnożenia

(c) The 4 times table

ciąg
Q2. Complete the Sequence

5, 10, 15, 20, 25, 30, 35

(add 5 each time — the 5
tabliczka mnożenia
times table)

Starter 7 (2 of 3)

wyrazów

Q3. Write the first 5 **terms** of $4n - 3$

—, —, —, —, —

Starter 7 (2 of 3)

wyrazów

Q3. Write the first 5 **terms** of $4n - 3$

1, 5, 9, 13, 17

Starter 7 (3 of 3)

- Q4. Start with the **5** **tabliczka mnożenia** **times table** **wyrazu** and **add 1** to every **term** **wyrazów**.
- (a) Write the first 5 **terms** **wzór na n-ty wyraz**.
- (b) What is the **nth term** **wyraz** rule?
- (c) Find the 20th **term** **ciągu**.
- (d) Is **104** in the **sequence**? Explain how you know.

Starter 7 (3 of 3)

Q4. Start with the **5** *tabliczka mnożenia* **times table** *wyrazu* and **add 1** to every **term** .

wyrazów

(a) Write the first 5 **terms** .

wzór na n-ty wyraz

(b) What is the *n*th **term** rule?

wyraz

(c) Find the 20th **term** .

ciągu

(d) Is **104** in the **sequence**? Explain how you know.

(a) 6, 11, 16, 21, 26. (b) $5n + 1$. (c) $5 \times 20 + 1 = 101$.

(d) $5n + 1 = 104 \Rightarrow 5n = 103 \Rightarrow n = 20.6$. **No**, 104 is not a *wyraz* **term** .